What is claimed is:

1. A method for analyzing an output signal matrix by comparison to an output signal matrix database, comprising:

(a) detecting a physical signal of each unit of a stimulated physical matrix comprising an ordered array of units having X and Y coordinates, each unit confining a different responder of a living thing comprising a plurality of different responders, or each unit confining a probe corresponding to said different responder, and an identifier for each said different responder or said probe, said living thing having been subjected to a stimulus affecting said different responder of a plurality of said units, said identifier providing a physical signal corresponding to the effect on said different responder;

(b) transducing each said physical signal to generate a corresponding electrical output signal;

(c) storing each electrical output signal in an output signal matrix data structure associating each output signal with the X and Y coordinates of the corresponding physical matrix unit of said stimulus; and

(d) determining the effect of said stimulus on said living thing by comparing the output signal matrix data structure of step (c) with an output signal matrix database.

2. The method of claim 1, wherein said output signal matrix database is produced by a method comprising the steps:

(a) detecting a physical signal at each unit of a physical matrix comprising an ordered array of units having X and Y coordinates, each unit confining a different responder of a living thing comprising a plurality of different responders, or each unit confining a probe corresponding to said different responder, and an identifier for said different responder or said probe, said living thing having been subjected to a stimulus affecting said different responder of a plurality of said units, said identifier providing a physical signal corresponding to the effect on said different responder;

(b) transducing each said physical signal to generate a corresponding electrical output signal;

(c) storing each electrical output signal in an output signal matrix data structure associating each output signal with the X and Y coordinates of the corresponding physical matrix unit of said stimulus; and

(d) repeating steps (a)-(c) to store output signal matrix data structures for a plurality of stimuli to form an output signal matrix database.

3. The method of claim 1, wherein said affecting is repressing.

4. The method of claim 1, wherein said affecting is inducing.

5. The method of claim 1, said comparing step comprising comparing the output signal matrix data structure of step (c) with said output signal matrix database according to comparison rules in a knowledge database.

6. The method of claim 1, said comparing step comprising using a neural network trained on said output signal database to compare the output signal matrix data structure to said output signal database.

7. The method of claim 1, said physical signal being an optical signal.

8. The method of claim 1, wherein said array comprises a predetermined functional class of said plurality of different responders or probes corresponding to said predetermined functional class.

9. The method of claim 8, said functional class comprising a sufficient ensemble of all different responders or probes corresponding to said different responders of said living thing to deduce in said comparing step (c) a path by which said stimulus elicits said output signal matrix data structure.

10. The method of claim 1, wherein said array comprises a majority of all different responders, or probes corresponding to said majority of all different responders of said living thing.

11. The method of claim 1, wherein said stimulated physical matrix comprises an ordered array of units having X and Y coordinates, each unit confining a cell containing a recombinant construct comprising a reporter gene, the expression of said reporter gene being operatively linked to the expression of a different endogenous promoter of a single organism comprising a plurality of different endogenous promoters, each said cell having been subjected to a stimulus affecting the expression of said different endogenous promoter in a plurality of said units, the expression of said reporter gene providing a physical signal corresponding to the effect on the expression of said different endogenous promoter.

12. The method of claim 1, wherein said recombinant constructs comprise a predetermined functional class of said plurality of different endogenous promoters.

13. The method of claim 12, said functional class comprising a sufficient ensemble of all said different endogenous promoters of said organism to deduce in said comparing step (c) the path by which said stimulus elicits said output signal matrix data structure.

14. The method of claim 11, wherein said recombinant constructs comprise a majority of all said different endogenous promoters of said organism.

15. The method of claim 1, wherein said stimulated physical matrix comprises an ordered array of units having X and Y coordinates, each unit confining a cell containing a recombinant construct comprising a reporter gene, the expression of said reporter gene being operatively linked to the function of a different endogenous protein of a single organism comprising a plurality of different endogenous proteins, each said cell having been subjected to a stimulus affecting the function of said different endogenous protein in a plurality of said units, the expression of said reporter gene providing a physical signal corresponding to the effect of the function on said different endogenous protein.

16. The method of claim 15, wherein the expression of said reporter genes is operatively linked to the function of a predetermined functional class of said plurality of different endogenous proteins.

17. The method of claim 16, said functional class comprising a sufficient ensemble of all said different endogenous proteins of said organism to deduce in said comparing step (d) a path by which said stimulus elicits said output signal matrix data structure.

18. The method of claim 15, wherein the expression of said reporter genes is operatively linked to the function of a majority of all said different endogenous proteins of said organism.

19. The method of claim 1, wherein said stimulated physical matrix comprises an ordered array of units having X and Y coordinates, each unit confining a hybridizer specific for a different endogenous transcript of a living thing comprising a plurality of different endogenous transcripts or cDNAs derived therefrom, said living thing having been subjected to a stimulus affecting the expression of said different endogenous transcript of a plurality of said units, said hybridizer providing a physical signal corresponding to the effect on the expression of said different endogenous transcript.

20. The method of claim 19, wherein said hybridizers are specific for a predetermined functional class of said plurality of different endogenous transcripts.

21. The method of claim 20, said functional class comprising a sufficient ensemble of all said different endogenous transcripts of said living thing to deduce in said comparing step (c) a path by which said stimulus elicits said output signal matrix data structure.

22. The method of claim 19, wherein said hybridizers are specific for a majority of all said different endogenous transcripts of said living thing.

23. A method for generating an output signal matrix database useful for correlating candidate stimuli and systemic responses, comprising:

(a) detecting a physical signal at each unit of a physical matrix comprising an ordered array of units having X and Y coordinates, each unit confining a different responder of a living thing comprising a plurality of different responders, or each unit confining a probe corresponding to said different responder, and an identifier for said different responder or said probe, said living thing having been subjected to a stimulus affecting said different responder of a plurality of said units, said identifier providing a physical signal corresponding to the effect on said different responder;

(b) transducing each said physical signal to generate a corresponding electrical output signal;

(c) storing each electrical output signal in an output signal matrix data structure associating each output signal with the X and Y coordinates of the corresponding physical matrix unit of said stimulus; and

(d) repeating steps (a)-(c) to store output signal matrix data structures for a plurality of stimuli to form an output signal matrix database.

24. The method of claim 23, wherein said affecting is repressing.

25. The method of claim 23, wherein said affecting is inducing.

26. The method of claim 23, said physical signal being an optical signal.

27. The method of claim 23, wherein said array comprises a predetermined functional class of said plurality of different responders or probes corresponding to said predetermined functional class of said plurality of different responders.

28. The method of claim 27, said functional class comprising a sufficient ensemble of all different responders or probes corresponding to said different responders of said living thing to deduce the path by which said stimulus elicits said output signal matrix data structure.

29. The method of claim 23, wherein said array comprises a majority of all different responders or probes corresponding to said majority of all different responders of said living thing.

30. The method of claim 23, wherein said stimulated physical matrix comprises an ordered array of units having X and Y coordinates, each unit confining a cell containing a recombinant construct comprising a reporter gene, the expression of said reporter gene being operatively linked to the expression of a different endogenous promoter of a single organism comprising a plurality of different endogenous promoters, each said cell provided a stimulus affecting the expression of said different endogenous promoters in a plurality of said units, the expression of said reporter gene providing a physical signal corresponding to the effect on the expression of said different endogenous promoter.

31. The method of claim 30, wherein said recombinant construct comprise a predetermined functional class of said plurality of different endogenous promoters.

32. The method of claim 31, said recombinant constructs comprise a sufficient ensemble of all different endogenous promoters of said organism to deduce a path by which said stimulus elicits said output signal matrix data structure.

33. The method of claim 30, wherein said recombinant constructs comprise a majority of all different endogenous promoters of said organism.

34. The method of claim 23, wherein said physical matrix comprises an ordered array of units having X and Y coordinates, each unit confining a cell containing a recombinant construct comprising a reporter gene, the expression of said reporter gene being operatively linked to the function of a different endogenous protein of a single organism comprising a plurality of different endogenous proteins, each said cell provided a stimulus affecting the function of said different endogenous protein in a plurality of said units, the expression of said reporter gene providing a physical signal corresponding to the effect on the function of said different endogenous protein.

35. The method of claim 34, wherein the expression of said reporter genes is operatively linked to the function of a predetermined functional class of said plurality of different endogenous proteins.

36. The method of claim 35, said functional class comprising a sufficient ensemble of all different endogenous proteins of said organism to deduce a path by which said stimulus elicits said output signal matrix data structure.

37. The method of claim 34, wherein the expression of said reporter genes is operatively linked to the function of a majority of all different endogenous proteins of said organism.